National Aeronautics and Space Administration

IT Talk

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in this issue

Office of the Chief Information Officer
NASA CIO Linda Y. Cureton

Note from the CIO

This issue of *IT Talk* is our chance to shine a spotlight on how NASA and its Centers are going green. Green efforts like virtualization and smart buildings do more than just reduce our impact on the environment, they make bottom-line business sense to our operations and finances. The Climate@Home article is an example of how our IT efforts go beyond NASA's needs and have global implications. More of our green efforts will be shared at this month's first IT Summit from August 16-18. I look forward to seeing you there! (see page four for more details).

Virtualization Technology

Source: Eric Herron, System Analyst, Marshall Space Flight Center

The NASA Enterprise Application Competency Center (NEACC) has concentrated in the last few years on efforts to "virtualize" server environments that provide applications and services at Marshall Space Flight Center (MSFC) and the Agency.

Virtualization means that multiple server environments (e.g., Windows, Linux, etc.) can be housed on a single piece of physical hardware. The server administrator uses a software application to divide one physical server into multiple isolated virtual environments. To the end user, the access to the virtualized server is a seamless experience.

Virtualization is often compared to cloud computing, but is different. Cloud computing, like NASA's Nebula, offers on-demand network access to a shared pool of configurable computing resources. Virtualization can be offered through a cloud or a more simplified set of resources.

While the promise of saving money has attracted many, most virtualization adopters also quickly discover that the approach offers an array of additional benefits.

Green computing: Green computing attempts to reduce the amount of hazardous materials used, the amount of energy consumed, and promotes recyclability or biodegradability of materials used in computing. Currently the NEACC operates 36 physical servers and 337 virtual machines using VMWare. The floor space reductions achieved in the data center approaches 12 to 1.

Servers and computers generate a lot of heat and break down if they are not kept cool. The NEACC was able to reduce 60 to 70 percent of the amount of space needed in the data center. This resulted in a power reduction ratio of 6 to 1. With the rising costs of utility bills, virtualization can also be a fast track to big savings. An estimated $5 million dollars in infrastructure costs have been avoided and the reduction per cubic foot of floor space used resulted in savings of $250,000.

Expanded flexibility: Virtualization allows centrally managed resource pooling through an enterprise hub to better support business requirements. Virtual machines can also be used to run different versions of operating systems. Such systems may be hard or impossible to run on newer hardware.

Better access: Virtualization's solid foundation and shared infrastructure provides enhanced access to infrastructure and information in the support of business applications and service-oriented architecture (SOA).

Rapid application deployment: Virtualization can provide rapid infrastructure provisioning that requires minutes rather than days. The technology can also make tasks such as system migration, backup and recovery more manageable.

Business resiliency: For easier replication and restoration, virtualization enables adopters to secure and isolate application workloads and data on virtual servers and storage devices. Virtual machines, by isolating what they run, can also provide fault and error containment. Archiving data and replicating the network off site through virtualization is a recipe for a robust disaster recovery plan.

(continued on page 2)

Photo Credit: NASA/David Higginbotham, Dynetics, Inc.

(Virtualization continued from page 1)

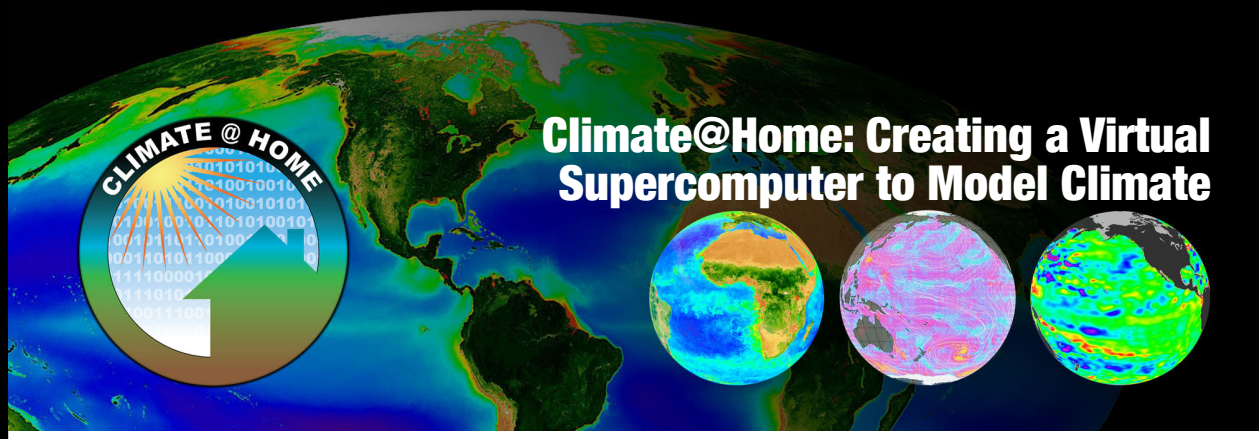
Improved security: Virtual machines can be used to offer secure, isolated test beds for evaluating untrusted applications.

The NEACC is now in the process of designing virtual disaster recovery and rapid recovery architecture for critical NEACC applications. The architecture will benefit the Agency by allowing for continuing operations for NEACC systems and application with minimal service interruption. ❐

NASA TELEVISION

High Definition Mission Television

Johnson Space Center has brought high definition (HD) video production to NASA's mission work. The next Shuttle launch, landing and in-flight coverage will be shown to the public in HD. ❐



Climate@Home: Creating a Virtual Supercomputer to Model Climate

NASA will be calling on people worldwide to help determine the accuracy of a computer model that scientists use to predict climate change. The initiative, called "Climate@Home," is unprecedented in scope. Never before has NASA attempted to recruit so many people to help perform research vital to forecasting the Earth's climate in the 21st century under a wide range of different situations.

NASA's Earth Science Division (ESD) and Office of the Chief Information Officer (OCIO) have strategically partnered to manage the Climate@Home initiative. This effort will include collaborations between the 10 NASA Centers, the 13 Federal agencies of the USGCRP (United States Global Change Research Program) along with several universities and private organizations.

Goddard Space Flight Center (GSFC)'s Robert Cahalan is serving as the project scientist and has assembled an international team of scientists to help set science goals and determine which parameters to run. GSFC's senior advisor to the CIO, Myra Bambacus, serves as the project manager and will run this initiative.

Participants need no special training to get involved in Climate@Home. All they need is a desktop computer or laptop. Volunteers will be able to download the computer model to run on their computers as a background process whenever the computers are on, but not used to their full capacity.

The climate model that volunteers download is made up of mathematical equations that quantitatively describe how atmospheric temperature, air pressure, winds, water vapor, clouds, precipitation and other factors all respond to the Sun's heating of the Earth's surface and atmosphere. Models help predict how the Earth's climate might respond to small changes in Earth's ability to absorb sunlight or radiate energy into space.

Scientists traditionally have used supercomputers to test the sensitivity and accuracy of climate models. With these powerful machines, they are able to run millions of calculations, each computing a different scenario or combination of circumstances such as varying levels of chlorine or water vapor in the atmosphere.

Instead of using supercomputers in this effort, NASA is creating a virtual supercomputing network that spreads the data-processing chores across thousands of computers. Such a task-sharing initiative eliminates the need to buy additional supercomputers, which consume enormous amounts of energy, and reduces the "carbon footprint" of running these calculations.

Prior to the initiative's official roll out in early 2011, the project will be announced in the news. The project website will provide instructions on how to download the models and supporting computer software. The goal is to have recruited tens of thousands of participants by the time the initiative begins. Each participant will run the same model but with certain parameters slightly adjusted. Scientists will examine the resulting sensitivity of the climate predictions to those adjustments, resulting in a better understanding of the parameters that should be studied in the future.

Climate@Home will have the option of using the same high-level architecture developed for "SETI@Home," a scientific experiment that uses Internet-connected computers in the Search for Extraterrestrial Intelligence program. The initiative also is modeled after a similar project coordinated by the Oxford e-Research Centre in the United Kingdom called Climateprediction.net.

Climate@Home will test the accuracy of a model developed by the Goddard Institute of Space Studies (GISS) in New York, and will serve as a trailblazer to explore the accuracy of other models as well. ❐

Same Day Service at Glenn

Source: Barbara J. Wilson, IT Specialist (Application Software), Glenn Research Center

"Why does it take so long for a new employee to receive his or her e-mail and computer access?" asked Dr. Sasi Pillay, Chief Information Officer at Glenn Research Center (GRC).

Up until 2007, it would take new staff (civil servants and support service contractors) one to three weeks and summer faculty and students one to five days after the start of service to receive e-mail and computer access. During 2008, GRC's CIO suggested that there should be a way for new hires to receive e-mail and

NASA to Open Sustainability Base, A Super Green Building

Source: Andrea M. Riso, Ames Research Center

NASA is building its most environmentally-friendly building at Ames Research Center (ARC) in Moffett Field, Calif. The structure, called "Sustainability Base," will likely be the "greenest" building in the Federal government if it receives Platinum LEED e-certification.

The ceremonial groundbreaking on the $20.6 million building is set for August 25 of this year. Move-in will be in spring or summer of 2011.

The name for the new facility pays tribute to the Tranquility Base from the Apollo 11 moon landing of July 20, 1969, when NASA astronauts Neil Armstrong and Buzz Aldrin became the first humans to land and walk on the lunar surface.

Sustainability Base will provide office space for ARC-IT and may also house some scientific research and engineering. Sustainability Base is designed to consume zero net energy. Compared to conventional buildings of equal size, it will use 90 percent less potable water.

The centerpiece of the building's cutting-edge technology is its intelligent control system, which is based on systems originally developed for NASA spacecraft. A computer inside Sustainability Base will connect to the Internet to call up weather forecasts for the local area to help plan environmental control.

Sustainability Base will track and report back energy usage statistics by workstation, allowing occupants to monitor individual consumption.

"ARC-IT looks forward to moving into the only Platinum LEED-eCertified Federal building. This new space will support our ability to be a collaborative, innovative and increasingly transparent organization," said Acting CIO at ARC James F. Williams. LEED, which stands for Leadership in Energy and Environmental Design, is an internationally recognized green building certification system. ❐

computer access the same day they start. He coined this vision "Same Day Service."

In order for this concept to be a success, all stakeholders had to be identified and involved. The stakeholders consisted of the Office of Human Capital Management, the Educational Programs Office, the Office of Protective Services and the Office of the Chief Information Officer (which includes the ODIN and PACE contracts). The stakeholders became the GRC On-Boarding Process Improvement Team.

The GRC On-Boarding Process Improvement Team met once a week to review the process for new staff, summer faculty, and students. During these meetings, the team reviewed each metric to see how long it was taking for each group to complete their process. Once they identified each of the individual groups' processes, the team developed a comprehensive end-to-end process that offered the opportunity to reduce the time for each step in the process. This formed the basis to achieve Same Day Service.

Same Day Service means that the on-boarded staff receive their badge and access to their e-mail and computer accounts on their first full work day. This year, GRC averaged 95 percent of students accessing their e-mail accounts the same day they were brought on-board. This year Summer Programs consisted of 34 faculty members and 289 summer interns.

This year, the GRC On-Boarding Process Improvement Team had a variety of activities to improve their ongoing efforts including incorporating the new Agency 2010 Temporary Employee Process. Each year, they send out a survey to capture lessons learned and solutions for the following year. For summer staff, a website was created and a presentation that included a skit was given to the mentors. The team also directed the mentors, computer administrators and ODIN POCs to a daily news page.

Here are some of the comments that were received:

"The thanks really goes to you [and] many others I know for all the 'behind the scenes' effort with student identities/badging, getting passwords assigned etc. Thanks much for **YOUR** hard work! Just wanted to share with you that we do have appreciative mentors with this year's process!"

"Thanks for the help having computers setup for summer—my student was up and operational on the first day." ❐

IT Outreach: NEACC's Annual CBPL Summit

The NASA Enterprise Application Competency Center's (NEACC) held its Seventh Annual Center Business Process Lead (CBPL) Summit in Annapolis, Maryland, from June 8 through 10.

This customer-focused event has evolved from a small group of Center financial leads during the early days following the "Core Financial" implementation. It is now a cross-discipline event with eight meeting tracks and multiple networking opportunities where more than 230 Center, Agency and NEACC representatives (both civil servants and support contractors) share information regarding the 50-plus NEACC integrated business applications.

Record attendance by more than 230 NASA and contractor employees resulted in standing-room only for popular sessions.

The three-day summit offered presentations, training and roundtable discussions, bringing together business disciplines that would not ordinarily have an opportunity to exchange ideas and discuss integrated processes with functional and technical experts.

A small sampling of this year's topics includes:

- **Cognos reporting tool.**
- **Bringing NEACC apps to mobile devices.**
- **Contractor on-boarding.**
- **NASA Emergency Notification and Accountability System (ENS).**
- **Unified Labor Account (ULA).**

Visit the NEACC's business portal to view summit presentations at bReady.NASA.gov.

For more information, e-mail *Barbara.s.henry@nasa.gov*. ❐

NASA CIO Offices Hold Tech Expos

Many Center CIO offices will host Technology Expos this summer. Two recent ones includes Stennis Space Center (SSC) and the Jet Propulsion Laboratory (JPL).

More than 400 employees registered the SSC event on June 16. The IT Expo highlighted products and services available through the NASA SSC OCIO and its support contracts, Information Technology Services (ITS) and Outsourcing Desktop Initiative for NASA (ODIN). Attendees were offered live classes, vendor displays and an opportunity to "Spin to Win" to identify energy savings steps within an office setting.

JPL's Office of the CIO welcomed more than 2,000 visitors on June 17 for their annual 2010 IT Expo. The expo theme highlighted IT products and services that support the JPL flight project community as they prepare for a number of launches and encounters to occur over the next two years.

Participants submitted more than 100 ideas in a contest for the best business use of an iPad at JPL. The winner will be part of the iPad pilot program. Nearly 200 iPhone users downloaded new JPL Mobile Applications at the event. ❐

But Wait, There's More!

Presentations, videos and more from NASA's IT Summit 2010 will be available for you to download after the event. Even if you could not be there, you do not have to miss out.

Post event comments and questions for the speakers at:

buzzroom.nasa.gov

www.twitter.com

Please use the event hashtag:

#nasait

Streaming Live...

The following speakers will be streamed **live** at:

www.nasa.gov/offices/ocio/itsummit

Monday, August 16, 2010

8:45 a.m.	Opening Remarks, Linda Cureton, Agency CIO
9:15 a.m.	Jim Stikeleather, Chief Innovation Officer, Dell Services
10:15 a.m.	Mark Bregman, Chief Technology Officer, Symantec
11:00 a.m.	David W. Cearley, VP & Gartner Fellow, Gartner, Inc.
1:00 p.m.	Charles Bolden, NASA Administrator

Tuesday, August 17, 2010

8:40 a.m.	Misti Burmeister, CEO, Inspirion Inc.
9:20 a.m.	Vint Cerf, Vice President & Chief Internet Evangelist, Google
1:30 p.m.	Jack Blitch, Vice President & General Manager Walt Disney Imagineering-FL

Wednesday, August 18, 2010

11:45 a.m.	Vivek Kundra, Chief Information Officer, United States of America
1:30 p.m.	Vernice Armour, "Zero to Breakthrough," VAI Consulting and Training, LLC

Note: All times are Eastern Standard Time Zone.

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